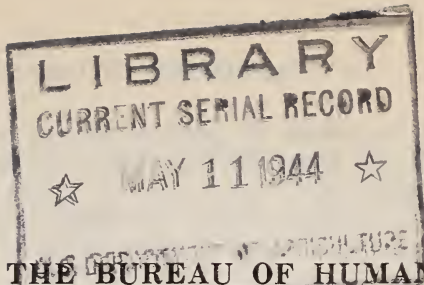


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**REPORT OF THE CHIEF OF THE BUREAU OF HUMAN
NUTRITION AND HOME ECONOMICS, AGRICULTURAL
RESEARCH ADMINISTRATION, 1943**

UNITED STATES DEPARTMENT OF AGRICULTURE,
Washington, D. C., September 15, 1943.

DR. E. C. AUCHTER,
Agricultural Research Administrator.

DEAR DR. AUCHTER: I submit herewith the report of the Bureau of Human Nutrition and Home Economics for the fiscal year ended June 30, 1943.

Sincerely,

HENRY C. SHERMAN,
Chief.

INEVITABLY, AS WAR GOES ON, additional adjustments become necessary in the homes of America. Yet also we realize more clearly how favored of fortune our country has been. Many commodities are in short supply as compared with our hitherto habitual levels of consumer demand, but at the middle of the year 1943, after a year and a half of full participation in the war, we still have the essentials for maintenance of a high level of health and efficiency.

Our task is to use these essentials in wholeheartedly scientific ways, to win the war as promptly as possible, and with such generous sharing of our goods with our Allies and the liberated peoples as shall lay the foundations for durable peace.

FAMILY SPENDING AND SAVING IN WARTIME

A study of rural family spending and saving in wartime has yielded information of major importance on farm family income.

Net money incomes of farm families averaged 44 percent higher in 1941 than in 1935-36. Increased agricultural production and higher prices paid to farmers for their output moved many farm families from lower to higher income classes and for farm families as a group made possible greater total expenditures for goods and services. At identical income levels for the two periods, differences in expenditures and savings were less marked, however.

Despite the increases of recent years, total net incomes of rural families (including single persons) in 1941 and the early months of 1942 were much below those recently reported for urban groups by the United States Bureau of Labor Statistics. Although national income from agriculture was approaching a record level in 1941, more than a third of the farm families and almost a quarter of the rural nonfarm had net money incomes from all sources amounting to less than \$500 in that year. Even after adding the value of food, housing, fuel, and other items obtained without direct money pay-

ment, nearly 40 percent of the rural families had total net incomes of less than \$1,000. Only 20 percent of city groups had incomes equally low.

The farm family at about the middle of the income range had a money income of about \$750 in 1941. This family spent about 31 percent of its income for food; 20 percent for housing, household operation, and furnishings; 16 percent for clothing; 12 percent for automobile and other transportation; and 16 percent for all other items of family living. Five percent of the income was available for gifts, taxes, and savings.

HOW GOOD ARE WARTIME DIETS?

The year 1942 saw considerable improvement in the nutritive quality of diets in the country as a whole, for both the rural and the urban population. Such were the facts shown by an analysis of family food consumption from the study of family spending and saving in wartime. With higher incomes and more money to spend for food, consumers bought more of the foods that contribute to good nutrition—milk, fruits and vegetables, eggs, and meats—than they did in 1936, when the last large-scale dietary study was made.

More specifically, the most important changes in family diets from the year 1936 to the spring of 1942 were increases of approximately 40 percent in the average per capita consumption of tomatoes and citrus fruit, 60 percent in green and yellow vegetables, and 25 percent in milk and its products, and a decrease of 25 percent in that of sugars and sweets.

To these and other less striking shifts in family food consumption can be attributed improvement in the average nutritive value of family diets, particularly in ascorbic acid, calcium, thiamine, riboflavin, and vitamin A value. Recent advances in the science of nutrition make it certain that these improvements have high value for health and for working efficiency. However, there are still large numbers of people who fail to achieve good nutrition because of inadequate incomes, the unavailability of foods, or lack of effective education in nutrition and food values.

In addition to the analysis of food-consumption data obtained from a sample of the population through the 1942 study of spending and saving in wartime, the Bureau also continues the evaluation, from the nutritive standpoint, of the per capita civilian food supply based on figures of production, stocks, exports, and imports. These evaluations provide information on the adequacy of the current overall civilian food supply and are also being used in a study interpreting recent trends in food consumption. Such facts are of special interest to the War Food Administration.

According to these studies, the United States civilian population had in 1940, 1941, and 1942 more calories, protein, and fat, and larger quantities of the minerals and vitamins that contribute to good nutrition, than in 1935-39. The most recent estimates for 1943 indicate that the per capita quantities of protein, the minerals, and vitamins will be higher than the corresponding quantities in 1935-39 and for some nutrients will be about as high as in 1941 or 1942. Calories in 1943 will be approximately the same as in 1935-39 and about 4 percent less than in 1942.

One of the most important increases since 1935-39 has been in thiamine (vitamin B₁). Chiefly owing to the flour and bread enrichment program, the quantity of thiamine in the 1942 civilian food supply was 15 percent larger than in 1935-39. For 1943, this increase is estimated at 28 percent.

WARTIME FOOD PLANS

Higher prices, food shortages, and rationing have made the business of feeding the family more difficult than ever for most housewives. To help them with their problems of meal planning and food buying under these conditions, special wartime adaptations of the Bureau's earlier diet plans have been prepared, together with suggestions for alternate foods when certain ones are unavailable or scarce. These plans give suggested quantities of 11 groups of foods for children of different ages and men and women doing various kinds of work. Any family can therefore estimate its own food needs from these master plans. The recommended quantities take into account probable supplies and allowances under rationing but do not lose sight of the permanent goal—providing for good nutrition.

LOSS IN FOOD VALUES DURING COOKING

After wartime food production is pushed to its highest possible level, there is still a way to add enormous quantities of food nutrients to the American dietary. This is by cutting cooking and food-preparation losses in American kitchens. Through carelessness and lack of understanding of the effects of heat, air, and water on foods we pour down the sink or allow to be destroyed (in cooking and standing) too large a percentage of the mineral and vitamin values of our common foods.

Various laboratories have conducted studies on various phases of such food losses. Results unfortunately are often not comparable, or not representative of home cooking methods. The Bureau of Human Nutrition and Home Economics is now attacking this problem in a systematic series of vitamin and mineral assays on common foods cooked by typical American home methods. The following are some of the results obtained during the last year.

Potatoes baked in their skins lost as much as 80 percent of their original ascorbic acid (vitamin C) and 50 percent of their thiamine (vitamin B₁). When the potatoes were boiled in their skins, the loss in ascorbic acid was only 40 percent and in thiamine from 15 to 20 percent. In other words, when potatoes were baked, the losses in ascorbic acid were about twice and in thiamine about three times as great as when they were boiled.

The loss in thiamine in oatmeal cooked directly over the flame for 21½ minutes is small; but when it is cooked for 30 minutes in a double boiler, the thiamine loss is 30 percent, or 15 times as great. The vitamin A value of yellow corn meal cooked by the two methods appears to be relatively stable.

In general, results indicate that cooking foods in moderate amounts of water for the shortest time possible gives an acceptable product and causes smaller loss in the water-soluble vitamins and the minerals than does longer cooking or cooking in large amounts of water.

The losses due to cooking vary with the type of food and frequently with different samples of the same food. The differences found in the various types of vegetables may be related to the amounts of surface of plant tissue exposed in proportion to volume. Carotene (plant source of vitamin A) appears to be relatively stable during cooking.

In general, vitamin losses during cooking are greater in leafy than in root vegetables.

SOYA PRODUCTS IN AMERICAN MEALS

When soya flour and grits come on the retail market in quantity this winter, the Department will release directions for using these products in a variety of dishes, from soup to dessert. These recipes are the result of 1,500 individual cooking and palatability tests in the Beltsville (Md.) food research laboratories—part of a soya project carried on in cooperation with the Food Distribution Administration.

These soya products, new to most American families, are in part a byproduct of the greatly expanded production of soybeans as a source of oil. By improved manufacturing processes the highly nutritious residue left after the oil is expressed or extracted is now being converted into protein-rich soya products. Used in the right way, these products are appetizing, low-cost supplements to our other protein foods. Because of differences in the chemical and physical make-up of these products, it was found best to keep the proportions of soya to other ingredients at conservative levels.

Briefly put, outstanding results of the study are:

In soup mixes consisting of soya flour or grits, other legume powders, dry skim milk, and seasonings, proportions of soya as high as 40 percent were found satisfactory.

In combination with a cereal, such as corn meal, cracked wheat, oatmeal, hominy grits, rolled oats, or granular wheat cereal, highly satisfactory results were obtained with as much as 15 to 20 percent of soya grits or flakes.

Acceptable proportions of soya in quick breads and yeast breads varied from 5 to 20 percent.

In a number of recipes soya was used in place of 5 to 25 percent of the meat, fish, eggs, or cheese. It was found that the naturally bland flavor of some foods (for example, cornstarch pudding, white sauce, spoon bread, potato cakes, and hominy grits) was made richer by the addition of soya flour or grits. All the soya products tested gave this improvement in flavor in these bland foods when conservative proportions of soya were used.

NUTRITIVE VALUE OF SOYA ALONE AND IN COMBINATION

To find the nutritional quality of the protein of soya products alone or in combination with other familiar foods, other series of tests were run. The following combinations were analyzed for the total protein content, protein quality, and some of the B vitamins: Soya flour plus corn meal; soya flakes and oatmeal; soup mixes consisting of soya flour supplemented by pea powder or dry skim milk or both; a soya-peanut butter spread; a vegetable chowder made of onions, carrots, potatoes, a little milk, and salt pork, including only 6 percent soya grits. These mixtures were tested both raw and cooked. The results

show that soya flour and grits supplement the protein of corn meal and oatmeal and that cooking definitely improves the nutritional quality of the protein of these combinations. Soya flour in the amounts used appears to supplement somewhat the protein of peanut butter and vegetable chowder.

The thiamine, riboflavin, and niacin content of the soya products is similar to that of whole wheat. Therefore the soya products, in addition to improving and adding to the protein of these combinations, also supplement their B vitamin content.

SOYBEAN, PEANUT, AND COTTONSEED PROTEINS PROMOTE GOOD GROWTH

The war early developed a situation that threatened a shortage of protein foods, particularly proteins from animal sources—meat, milk, and eggs. This situation emphasized the need of giving attention to the nutritional value of plant proteins that may serve in the diet. Feeding experiments with albino rats demonstrated that the proteins of soybeans, peanuts, and cottonseed have high nutritive value, and that they offer excellent possibilities for relieving the shortage of animal proteins. Young animals fed peanut flour as the sole source of protein in the diet grew four times as fast as another group fed a similar diet in which the same amount of protein was furnished by patent wheat flour. Similarly the proteins of soybean flour were found to have a growth-promoting value five times that of patent flour.

Addition of relatively small quantities of these oilseed flours to patent wheat flour greatly enhances its protein value. Nutritionally the protein value of a food depends not only on the quantity of protein present, but also on the kind of protein. If a protein does not contain all of the nutritionally essential amino acids, it will not support growth or maintain an animal in a satisfactory state of health and nutrition no matter how much is eaten. The oilseed proteins are admirably suited to supplement the proteins of wheat flour. Wheat flour is known to be poor in some amino acids that are abundantly present in soybeans, peanuts, and cottonseed.

The use of soybean, peanut, and cottonseed flours offers one of the most effective, economical, and practical ways of meeting the world shortage of protein foods. They are highly nutritious and may be used in a variety of ways in human foods.

WHEATS STUDIED FOR VITAMIN VALUE

The greater emphasis on cereals in wartime diets calls for more exact knowledge of the vitamin value of different varieties of wheat. Locality also is known to make a difference in the composition of the wheat berry. The following tests completed during the year as part of a cooperative study with the Bureau of Plant Industry give additional facts on the thiamine content of eight varieties of hard red winter wheat. These wheats were grown in five localities in the Great Plains. The thiamine assays were made by rat-growth method. The wheats tested included Blackhull from four localities, Cheyenne from five localities, Chieftain from two localities, Nebred from five

localities, Tenmarq from five localities, Oro \times Tenmarq from four localities, and Kawvale \times Tenmarq from three localities.

Tenmarq wheat from all the localities led the other varieties in thiamine content. The two Tenmarq crosses from all localities were also high in thiamine content, though neither equalled Tenmarq. The Nebred variety was a close second to Tenmarq.

The wheats grown in Akron, Colo., were noticeably richer in thiamine than those from the other localities, while those grown in Lincoln and North Platte, Nebr., surpassed those grown in Colby and Manhattan, Kans.

HOME-BUILT FOOD DRIERS

To aid families handicapped by lack of pressure canners in preserving Victory Garden products, research was pushed on equipment and methods for drying food at home.

Designs for three new or improved portable driers were completed. Plans and operating directions were distributed speedily to the public through press and magazine channels as well as by means of the Extension Service and other agencies in direct contact with home-makers.

The top-of-stove drier, designed for use on any kitchen stove burning gas, liquid fuel, wood, or coal, calls for practically no strategic materials and can be built by many families for \$10 or less. Cabinet capacity is 5 to 10 pounds of raw food as prepared for drying. Such a home-built drier thus offers a low-cost means of preserving small quantities of garden fruits and vegetables.

For owners of modern gas and electric ranges, directions for the oven method of drying small quantities of fruits and vegetables were perfected. The equipment is simple and can be home-made. An illustrated folder was prepared with diagrams for building trays and blanching basket, along with complete how-to-do-it directions for handling all the common fruits and vegetables.

Plans and working drawings for building an electric home food dehydrator with controlled heat and air flow are nearing completion. This dehydrator is designed for families who may have at their disposal a $\frac{1}{4}$ -horsepower portable electric motor and the screw-in type of heating elements used in a baby-chick brooder. The fan is of wood. Electric cord, plugs, and a thermostat may be the only strategic materials some families will need to purchase for building this drier. It does call, however, for expert workmanship in construction.

Drying times are definitely affected also by the load on the tray. The smaller the load, the shorter the drying time. Decreasing the tray load, however, increases drying costs. From a cost and time standpoint the most satisfactory results were obtained by using $\frac{1}{2}$ to 1 pound per square foot of leafy green vegetables and 1 to 2 pounds per square foot of other vegetables and fruits. Results also show that the smaller the pieces of food the shorter the drying time.

STORAGE TESTS ON HOME-DRIED FOOD

How well do home-dried foods hold their food value and flavor? To answer that frequently asked question, fruits and vegetables dried in the laboratory last year and stored under different conditions were

examined for changes in palatability and in some cases for nutritive value.

Peaches, pears, blackberries, cherries, and prune plums, according to these tests, retained their palatability when stored at room temperature for a year, the longest storage time yet studied.

Vegetable tests included beets, beet greens, carrots, chard, corn, kale, mushrooms, mustard greens, green peppers, pumpkin, Hubbard squash, snap beans, sweetpotatoes, tomatoes, and turnip greens.

Of these, the dried green leaves were among the most satisfactory. They deteriorated only slightly in palatability during 6 months' storage at room temperature.

Vitamin studies of kale showed that the carotene (plant source of vitamin A) suffered no appreciable loss during precooking or dehydration and only slight loss during storage for 3 months at 45° F. in glass jars sealed with rubber rings. Ascorbic acid (vitamin C) suffered a loss of about 90 percent during pretreatment and dehydration and the rest was practically all lost during storage under the conditions noted above. A similar loss of ascorbic acid was observed in sweetpotatoes.

Sweetpotatoes retained palatability, however, for 6 months at a temperature as high as 74° F., but not at 100° F. Sweetpotatoes were stored in a variety of packages available to the homemaker. Glass jars with rubber rings, sealed tin cans, friction-top cans, mayonnaise jars with waxed paper in the cap, and coffee cans were found to be superior to paper cartons, cardboard boxes, or paper bags in retaining palatability of the stored food.

Freshly dried mushrooms were satisfactory in flavor and rich in riboflavin, although texture and color were not well retained. The flavor deteriorated during 3 months' storage at temperatures from 45° to 90° F.

Dried snap beans were found to maintain their original palatability fairly well over a period of 6 months. Good results were also obtained in drying and storing sliced and diced beets.

To sum up, ascorbic acid was largely destroyed during dehydration and storage by the home methods so far used. Other vitamins were probably better conserved. In general, the cooler the storage the better was palatability retained.

Throughout these tests it was kept clearly in mind that dehydrated food develops a flavor characteristically different from the same food when fresh, but not necessarily less pleasing. The universal acceptance of raisins and prunes as different from fresh grapes and plums are cases in point. Through more extensive use of dried foods the public will undoubtedly come to know and relish the flavor of dehydrated food as a way of adding variety and interest to the bill of fare and extending the use of more perishable foods throughout the year.

PALATABILITY OF DEHYDRATED EGGS

Commercially dehydrated eggs are being shipped abroad under lend-lease for household use in other countries. To find the effect of storage time and temperature on their usability, samples of dried egg from five processing plants were stored at temperatures ranging from 0° to 110° F. and tested at various intervals of time up to 56

weeks. They were tested in scrambled eggs, foundation cake, popovers, mayonnaise, and baked custard.

Dried eggs stored at temperatures below 60° F. retained their original palatability at least 1 year; when stored at 68° or 75° F. there was a gradual deterioration and the dried eggs were found unsuitable for use in scrambled eggs after 4 to 7 months in storage. At temperatures above 75° F. there was a rapid deterioration. Dried eggs stored at 104° to 110° F. were unsatisfactory for use in scrambled eggs and baked custards in 1 week, and for mayonnaise, popovers, and cake in less than 3 weeks. Samples from different processing plants varied in their storage properties.

CLOTHING AND FABRIC CONSERVATION

Several months before War Production Board Chairman Donald Nelson's recent call for a broad public program on consumer care of clothing and fabrics to avoid clothes rationing, Bureau specialists began giving intensive study to clothing and textile conservation. A series of publications were issued covering wool, rubber, and other articles of clothing and household use important to maintenance of civilian health and morale.

The need to conserve wool, for example, drew attention to the possible waste of suits discarded as men go into uniform. To prevent such waste and help relieve pressure on reduced stocks of new merchandise, clothing specialists on the Bureau staff drafted detailed instructions for making these suits into garments for other members of the family. A pattern manufacturer is cooperating by producing patterns for designs so originated and making them available through retail outlets.

With a view to keeping wearable clothing in service, an illustrated bulletin, *Mending Men's Suits*, was issued. This gives homemakers professional techniques of repairing wool suitings, retreading trousers, and otherwise extending the life of this type of civilian clothing. Expert methods of mending other types of clothing and household textiles were also made available in printed and illustrated form. Likewise, practical suggestions on the care of wool, based on scientific understanding of this fiber, highly important for its warmth and protective qualities, were given wide distribution.

The Bureau's stain-removal bulletin, long a handbook for ready reference in millions of American homes, was revised to include directions for removing new types of stains and also to bring it in line with supplies of chemicals now available as stain removers. Many of the solvents and reagents used in stain removal have gone off the market as the result of industrial war demands. The new bulletin gives household methods for removing over 100 common stains, with necessary cautions against damaging different kinds of fibers.

MILDEW PROTECTION FOR FABRICS

Mildew, the creeping fungus growth that works its way into the interstices of the finest fabrics, is responsible for staining and rotting vast quantities of cloth each year. Particularly is it damaging to cotton awnings, porch-furniture covers, and shower curtains where repeated wetting and slow drying furnish the mildew organism

conditions ideal for growth. In coastal and tropical areas, towels, bedding, and all household fabrics and clothing are also frequently damaged by mildew. Cotton cloth used in seedbed coverings for forest-tree seedlings and young tobacco plants likewise goes to pieces more quickly as a result of mildewing.

Working to find effective, cheap, mildew-resistant treatments for cloth, textile specialists in the home economics laboratories recently completed tests on 150 such treatments. They include use of natural dyes, 8-hydroxyquinoline combined with various inorganic salts, and phenolic compounds applied with emulsifying agents, as well as new ways of applying the chemicals to the cloth.

These mildew-resistant treatments, originally devised for household textiles, are undergoing further study as an aid to agricultural production. When wartime shortages made the conservation of all outdoor fabrics necessary, the possibility arose of prolonging the life of thousands of yards of cloth needed every year in agriculture. Investigations were initiated, in cooperation with the Forest Service, on the durability of seedbed coverings treated with various mildew-resistant finishes. Treated seedbed covers are being used, under the supervision of the Forest Service, for red oak and loblolly pine seedlings on both dry and moist soil for 1-, 2-, and 3-year periods in Forest Service nurseries in Maryland, Georgia, Nebraska, Michigan, and West Virginia.

A similar experiment was undertaken in cooperation with the Division of Tobacco Investigations of the Bureau of Plant Industry, Soils, and Agricultural Engineering. Covers treated with mildew-resistant finishes for tobacco beds are being used for 1- and 2-year periods under the supervision of experiment stations in Georgia, South Carolina, North Carolina, Tennessee, and Maryland.

Since, under climatic conditions favoring mildew, insects also cause deterioration of fabrics, some exploratory experiments have been made, in cooperation with the Bureau of Entomology and Plant Quarantine, to develop treatments that are both fungicidal and insecticidal.

EFFECT OF STORAGE ON FABRICS

A 4-year study of fabrics in storage, recently completed, gives a factual answer to the often-debated question, "Do fabrics lose strength during storage under different temperature conditions?" Choosing fabrics typical of cotton, linen, and wool, textile specialists stored samples under conditions representative of year-round household temperatures in Washington, D. C. Breaking-strength and other physical and chemical tests were made on the fabrics at 6-month intervals throughout the experiment.

All three materials, it was found, were more damaged when kept at a high temperature (102° F.), chosen to simulate attic conditions in the summer, than at room temperature (78° F.). More chemical deterioration resulted when the three fabrics were kept in diffused light than in the dark at the same temperature. New cotton fabric changed more during the storage than did the comparable fabric from which the starch had been removed at the beginning of the 4 years. Consequently, rules for home storage of textiles boil down to this: Store fabrics and clothing at as low a temperature as convenient and in the dark. Also, remove finishing materials, such as starch, from cotton fabrics before they are put away for extended periods. Con-

formity with such rules will help men and women in the armed service to store their civilian clothing for the duration with least damage to the fabrics.

COTTON OF VARIOUS STAPLE LENGTHS FOR HOSIERY

Need for making the best possible use of available supplies of cotton was the wartime purpose for continuing comparative studies of the merits of different hosiery constructions and of different varieties of cotton when manufactured into the article of clothing.

For example, Pima, $S \times P$, and $P \times (S \times P)$, $1\frac{1}{16}$ -inch staple length American-Egyptian cottons and Coker Wilds, $1\frac{3}{8}$ -inch staple American upland were spun into yarns and then knit into women's full-fashioned hosiery of identical construction. These hose were subjected to wear and laboratory tests.

There was no significant difference in the length of service of the hose made from the three American-Egyptian cottons and those from the upland variety. From the standpoint of service, upland cotton can advantageously be used in place of the longer staple American-Egyptian for knitting women's full-fashioned hosiery, thus conserving the longer staple for military purposes. In chemical deterioration of the hose during use, little or no difference was found among the four cottons.

In the case of the $S \times P$ cotton, the effect on serviceability of variation in the toe reinforcements of the hose was studied. The use of an extra yarn in this section, that is, three ends in place of two, considerably reduced the mending of the stockings required during wear. The findings from the service study of these hose made of $S \times P$ cotton were in accord with those from the laboratory abrasion tests.

WOMEN'S WORK CLOTHES

Carrying further the Bureau's pioneer accomplishment in women's work clothes, which started a new development in the garment and pattern industries, clothing specialists cooperated with the Extension Service in designing the uniform for the Women's Land Army. These garments for field and town wear embody "action" features already given thorough test in the Department's earlier designs for women's work clothing. Seventeen such designs for clothing adapted to different occupations were produced in commercial patterns by four companies. Although designed and distributed before the War Production Board issued its ruling on cut of women's work clothes, most of these designs were so economical of cloth that they could be continued with few if any changes.

At the request of a large aircraft company three protective outfits and work aprons were designed for women employed in airplane construction. These were developed after study of women on the job in the plant and incorporated safety features that drew favorable comment from the insurance underwriters.

STANDARD BUDGETS

Work has been started on the construction of farm and urban family budgets and the determination of the cost of living as measured by

such budgets in order to contribute to the study of parity income for farmers. This involves the selection of goods and services comprising a specified standard of living, the determination of their replacement rates, and the description of these goods and services in such manner that they can be priced in various communities. Present cost-of-living indexes measure only changes in the cost of goods and services from time to time. They do not measure the cost in dollars of a family budget that defines a specified standard of living at a given place and time.

An earlier budget for single women, widely used by State minimum wage commissions in making cost-of-living studies as the basis for setting a minimum wage for women, is being revised to bring it up to date for wartime living conditions, and to add a section on estimating the cost of the budget.

A mimeographed publication, *Living on Your Salary in Wartime Washington, Guide to a Spending Plan for Government Girls*, was undertaken at the request of the Director of Personnel in the Department of Agriculture. This spending plan for single women presents a more complete approach to the problem of planning expenditures than has been available up to this time. It attempts to do two things: (1) To show that personal or family budgeting is a process of planning that must be carried on by the group that is to benefit, through a series of alternate choices, and (2) to suggest minimum standards, as for example, nutritional needs.

GETTING THE FACTS TO THE PUBLIC

Government-sponsored campaigns on the home front rely for their success on simple, authoritative how-to-do-it instructions for mass distribution to the Nation's homes. Drawing on its background of research data, the Bureau of Human Nutrition and Home Economics prepared materials for three such campaigns during the past year.

The publication *99 Ways to Share the Meat* was prepared at the request of the Office of War Information as the consumer document for the voluntary share-the-meat campaign.

For the Nation-wide home food-preservation campaign, a folder, *Wartime Canning of Fruits, Vegetables*, fulfilled a similar purpose. This folder carries step-by-step directions for handling the common kinds of home-grown fruits and vegetables. It also illustrates and tells how to use the new wartime seals for glass jars.

For the benefit of families canning for the first time, this folder was followed by a series of 20 wall charts showing in picture sequences exactly how to can tomatoes, peaches, and string beans. These three series also demonstrate the correct procedure for adjusting the three most widely used glass jar closures. Then, to help still further in the preservation of tomatoes, most extensively grown Victory Garden vegetable and highly important for vitamin C, a special picture folder was issued on *Canning Tomatoes*.

For families unable to obtain canning equipment a folder, *Oven Drying—One Way to Save Victory Garden Surplus*, was prepared. Also, throughout the spring and summer, weekly radio and press releases answered specific questions encountered by home canners. Re-

peated warnings against oven canning and other scientifically unsound methods of home food preservation were given.

Ready for use in the nutrition and food-conservation campaigns scheduled to reach the public this fall are six other publications giving pertinent wartime suggestions. These are *Fats in Wartime Meals*, *Green Vegetables in Wartime Meals*, *Root Vegetables in Wartime Meals*, *Dried Beans and Peas in Wartime Meals*, *Vitamins from Farm to You*, and *Fight Food Waste in the Home*. Supplementing the last two on the pictorial side are two sets of charts for window display and lecture use. These give specific suggestions on the right storage and cooking methods to prevent waste of food, both the seen waste, which registers as wilted and damaged food, and the unseen waste through loss of vitamins and minerals.

Orders by the War Production Board curtailing the production of household equipment, textiles, and clothing indicate the need for strict conservation of such civilian goods now on hand. To help homes keep their present equipment lasting "for the duration" or longer, seven publications giving concise direction for care and economical use of important labor-saving devices were printed. These cover washing and ironing equipment, refrigerators, gas and electric ranges, vacuum cleaners and carpet sweepers, sewing machines, and care and repair of electric cords and plugs. Paralleling these publications for home use, charts were prepared carrying the story in picture form for teaching and demonstration purposes.

Eleven printed or duplicated bulletins gave similar conservation and repair information on clothing and household textiles, including rubber goods irreplaceable during the war.

Public demand for these wartime home economics publications is registered in the year's distribution figures. Of the 113 printed publications available, distribution totaled 28,229,858 copies, including sales by the Superintendent of Documents. Many of these bulletins have also been reprinted by State and other agencies and used as the basis of press and radio material by units within and outside the Government. These distribution figures, significant as they are, therefore represent only a fraction of the ways in which this home economics research is reported to the Nation.

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